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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.     | CONFIRMATION NO.       |
|--|-------------|----------------------|-------------------------|------------------------|
| 10/729,989   | 12/09/2003  | Jin-Woo Park         | 61610112US              | 2761                   |
| 58027 7590 07/26/2007<br>H.C. PARK & ASSOCIATES, PLC<br>8500 LEESBURG PIKE<br>SUITE 7500<br>VIENNA, VA 22182 |             |                      | EXAMINER<br>ROY, SIKHA  |                        |
|  |             |                      | ART UNIT<br>2879        | PAPER NUMBER           |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/729,989

Applicant(s)

PARK ET AL.

Examiner

Sikha Roy

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 26-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

The Amendment, filed on May 5, 2007 has been entered and acknowledged by the Examiner.

Claims 26-33 have been withdrawn. Claims 1-25 are pending in the instant application.

### *Claim Objections*

Claims 1 and 14 are objected because of the following:

The claim(s) contains subject matter ' a porous material layer consists of a transparent material without a polymer adapted to transmit light emitted by the organic EL portion to the front substrate and to absorb moisture and to **remain transparent even after absorption of moisture**' which has not been described in the specification in order to explain how the porous silica layer stays transparent after absorption. Applicant has described in Remarks section page 9 paragraph 5, that **as a result** of making the silica layer by the method described it becomes transparent. But the Examiner submits that this (i.e. transparency of the layer as a result of the method of fabrication) has not been disclosed in the specification. Which factors determine the transparency of porous silica film even after absorption of moisture? The specification only discloses (page 8 lines 1,2) the porous silica layer is maintained at a transparent state before and after absorption of moisture but does not provide any details to explain how this is achieved.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 -25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,803,127 to Su et al., U.S. Patent 6,791,256 to Nishizawa et al., U.S. Patent 5,321,102 to Loy et al. and further in view of U.S. Patent 6,762,553 to Yokogawa et al.

Regarding claim 1 Su discloses (Fig.3 column 3 lines 35-67) an organic EL display device comprising a rear substrate 42, an organic EL portion 48 formed on the surface of the rear substrate 42 and having a first electrode 45, an organic layer 47 and a second electrode 49 sequentially laminated, a front substrate 46 coupled to the rear substrate 42 at an internal surface of the front substrate to seal an internal space 52 in which the organic EL portion is accommodated thereby isolating the organic EL portion 48 from outside and a moisture-absorbing layer 50I coated on the internal surface of the front substrate 46.

Su does not disclose explicitly the sealant disposed between the rear substrate and the moisture-absorbing layer.

Nishizawa in the same field of endeavor discloses (Fig. 9 column 13 lines 1-41) a flat display device including a sheet-like rubber GS containing dehumidifying agent or

free oxygen absorber and the sealant SL is coated between the moisture absorbing layer GS and the substrate SUB1, coupling the two substrates SUB1 and SUB 2.

Nishizawa discloses this configuration provides a display device which blocks penetration of moisture or gases via the facing portions at the peripheries of the substrates and hence a good display is obtained for a longer period of time.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the transparent moisture-absorbing layer of Su so that it extends to the end of the rear substrate and the sealant is disposed between the moisture-absorbing layer and the rear substrate as taught by Nishizawa for providing a display device which blocks penetration of moisture or gases via the facing portions at the peripheries of the substrates and hence providing a good display for a longer period of time.

Claim 1 differs from Su and Nishizawa in that Su and Nishizawa do not exemplify the moisture absorbing layer comprising a porous material layer comprising a transparent material adapted to transmit light emitted by the organic EL portion to the front substrate and to absorb moisture and to remain transparent even after absorption of moisture.

Loy in relevant art discloses (column 1 lines 21,22, column 2 line 65 through column 3 line 5) use of porous silica material as desiccating water from closed packages. Loy further teaches this porous silica gel (template removed by oxygen plasma leaving only silica gel column 5 lines 45-53) without polymer acts as a high surface area desiccant and can be formed into thin films. Yokogawa in pertinent field

discloses (column 9 lines 61-67, column 10 lines 1-13) porous silica material (silica aerogel) having high porosity (preferably at least 80%) and light transparency. It is the position of the examiner that the desiccating agent of Loy being same porous silica gel with absorption holes acting as molecular sieve would have the property of being transparent and staying transparent as taught by Yokogawa.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the moisture-absorbing layer of Su and Nishizawa by the porous and transparent silica gel which absorbs moisture and stays transparent as taught by Yokogawa and Loy for providing excellent desiccation in the display with high surface area and hence enhancing the operating life.

The Examiner notes that the claim limitation that “wherein the porous material layer is formed by coating a mixture comprising a silica on the internal surface of the front substrate and firing the mixture” is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113). Therefore, it is the position of the examiner that it would have been obvious to one of ordinary skill in the art that the transparent moisture absorbent layer as disclosed by Su and Loy is at least a fully functional equivalent to the Applicant’s claimed porous material layer.

Regarding claim 2 Su, Nishizawa and Loy disclose the moisture-absorbing layer having plurality of absorption holes.

Regarding claim 3 Loy discloses (claim 9) the plurality of absorption holes having diameter less than 2 nm.

Regarding claim 4 Su discloses (column 3 line 66,67) the moisture absorption layer having thickness of less than 10  $\mu\text{m}$ .

Regarding claim 5 Loy discloses (claim 9) the plurality of absorption holes having diameter less than 2 nm.

Regarding claim 6 Su, Nishizawa and Loy are silent about the first electrode being transparent and second electrode being reflection type.

Yokogawa discloses (Fig. 11 column 1 lines 34-46) an EL layer 13 sandwiched between a first transparent electrode 12 and a back metal electrode 14 made of reflecting aluminum formed on glass plate 11. Yamada discloses this structure is a basic structure and used for EL device where light emission takes place from the bottom glass plate.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to employ the basic structure for the laminated EL portion of Su, Nishizawa and Loy as disclosed by Yokogawa for having a display with light emission taking place from the bottom substrate.

Regarding claim 7 Su, Nishizawa, Loy and Yokagawa do not exemplify the first electrode being reflection type and the second electrode transparent.

It would have been obvious to form electrode stack in a reverse order so that the bottom electrode is reflecting and top electrode is transparent of the EL portion of Su, Nishizawa, Loy and Yokogawa for having a display with light emission from the top substrate.

Regarding claims 8 and 9 Su discloses (Fig. 3 column 3 lines 55-67) another inorganic protection layer 50II made of metal oxides provided on the second electrode.

Regarding claim 10 Su discloses (column 2 lines 25,26) the space between the rear and front substrate is sealed and formed air tight. It would have been obvious to specify the space defined between the rear and front substrates being vacuum so that there is no generation of impurities in the space reacting with the organic EL portion thus preventing formation of dark spots and resulting in prolonged active life of the display.

Regarding claim 11 Su discloses (column 1 lines 54-61) the internal space defined by the front and rear substrate is filled with dried inert gas.

Regarding claim 12 Su discloses (column 3 lines 45-47) the front substrate 46 is made of glass.

Regarding claim 13 Su discloses (Fig.3) a protection layer 50I for protecting front substrate is formed on internal surface of the front substrate.

Regarding claim 14 Su, Nishizawa, Loy and Yokogawa disclose all the limitations same as of claim 1 and additionally disclose the moisture absorbing layer coated on the



internal surface of the front substrate is made of porous silica layer with a plurality of absorption holes.

Claims 15-17 essentially recite the same limitations as of claims 3-5 respectively and hence are rejected for the same reasons (see rejection of claims 3-5).

Claims 18 and 19 essentially recite the same limitations as of claims 6,7 respectively and hence are rejected for the same reason.

Claims 20,21 and 23-25 essentially recite the same limitations as of claims 8,9 and 11-13 respectively and hence are rejected for the same reasons (see rejection of claims 8,9,11-13).

Claim 22 essentially recites the same limitation as of claim 10 and hence is rejected for the same reason (see rejection of claim 10).

### ***Response to Arguments***

Applicant's arguments filed May 7, 2006 have been fully considered but they are not persuasive.

Regarding applicant's allegation that Yokogawa discloses silica aerogel which has hydrophobic properties the Examiner points out that Yokogawa discloses (column 4 lines 23-32, column 11 lines 44-46) one embodiment in which silica gel material has

been conferred to hydrophobic property by subjecting the material to hydrophobic treatment. This is a different embodiment from the one considered to show that porous silica aerogels are transparent. Yokogawa discloses (column 4 lines 13-22, column 9 lines 61-67, column 10 lines 1-13) that porous silica gel which can be made in the form of thin film has low refractive index, high porosity and light transmittance. Furthermore it is worth mentioning here that Hotta et al. (USPN 6,709,806) also disclose that porous silica aerogel is excellent in light transparency. Loy discloses silica gel material having plurality of holes with diameter between 0.5 to 100 nm (as claimed by the applicant) acting as molecular sieve and hence would have the same property of being transparent and staying transparent.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Application Publication 2005/0031791 to Sasaki et al. discloses the porous silica thin film with pores wherein the sizes of the pores are relatively uniform and are satisfactorily smaller than the wavelength of the visible light. By virtue of these features, the coating composition can be used to form a porous silica thin film having a low refractive index, a high light transparency and a high strength. U.S. Patent 5,746,992 to Yoldas et al. discloses silica aerogel is a silica gel from which liquid has been removed by 'supercritical heating'. JP 10-275679 to Tokitou et al. discloses an organic element with porous layer of moisture absorbent.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (571) 272-2463. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*Sikha Roy*

Sikha Roy  
Primary Examiner  
Art Unit 2879